

3

following will give a detailed description on the present invention in connection with the drawings and the detailed embodiments.

First Embodiment

As illustrated in FIG. 2, the present embodiment provides a display panel, and the display panel comprises an array substrate **100**, a printed circuit board **300**, and a chip on film (COF) **200**. A chip **201** is disposed on a first surface of the COF **200**, and one end of the first surface is attached to a connection region **400** of the array substrate **100**, and the other end of the first surface is attached to the printed circuit board **300**. The first surface of the COF **200** faces the array substrate **100**, and the connection region **400** is disposed at a side of the array substrate **100** away from a light-emitting surface.

The one end of the first surface of the COF **200** is attached to the connection region **400**, that is, in a manner of inner attaching (i.e., the chip faces the array substrate), and the other end of the first surface is attached to and connected with the printed circuit board **300**. In comparison with the prior art, the present embodiment may dispose the printed circuit board **300** on the back side of the array substrate **100** without having to fold the COF **200** by 180°, and since such a design does not have a folding region, the frame of the display panel may be narrowed, and at the same time, the folding radius is eliminated, so the display apparatus may be made thinner, and it is advantageous for thinning design. Since insulating glue or sealant covers the region where the array substrate **100** and an package layer **101** (the package layer **101** may be a sheet of separate substrate, and may also be a package cover) are bonded and the connection region **400**, the chip **201** on the chip on film **200** would not contact the wire on the connection region **400**.

Of course, if the manner illustrated in FIG. 3 is adopted, the COF may be folded, but it is inner-folded (that is, folded in a direction towards the array substrate), and it may also play a role to narrow the frame, but the thickness of the display apparatus is still too large.

Preferably, the display panel may be an active matrix organic light emitting diode (AMOLED) display panel. The non-light-emitting surface of the array substrate of the display panel is provided with a package layer **101**, and the area of the array substrate is larger than that of the package layer **101**, and the connection region **400** may be disposed at the segment difference between the array substrate **100** and the package layer **101**.

As illustrated in FIG. 4, the above display panel may be an AMOLED display panel which emits light from the bottom. An organic light emitting diode **500** may be disposed on the array substrate **100**, and the organic light emitting diode **500** generally comprises an anode **501**, a cathode **502**, and a "light-emitting layer" interposed between the anode **501** and the cathode **502**. The "light-emitting layer" may be constituted by a plurality of different layers; the "light-emitting layer" comprises at least one organic electroluminescence material layer (EML) **503**, and may further comprise: an electron transport layer (ETL) **506** and an electron injection layer (EIL) **507** between the EML **503** and the cathode **502**, a hole injection layer (HIL) **504** and a hole transport layer (HTL) **505** between the EML **503** and the anode **501**, and so on. Since in the AMOLED display panel which emits light from the bottom, the structures such as leads on the array substrate **100** are disposed on a surface of the array substrate **100** away from the light-emitting surface, and the direction of the connection region **400**

4

exactly meets the requirement of the present embodiment. However, it should be understood that, with respect to other types of display panel, the structure of the present embodiment may also be applied, as long as the connection region **400** is disposed on a side of the array substrate **100** away from the light-emitting surface.

In an embodiment, the printed circuit board **300** may be disposed on a side of the array substrate **100** away from the displaying surface (that is, disposed on a surface of the array substrate which does not emit light). Thus, the printed circuit board **300** would not block the light, and would not occupy the area of the displaying region.

In an embodiment, the COF **200** may be attached to a surface of the printed circuit board **300** away from the array substrate, and the electronic components **301** of the printed circuit board **300** is also disposed on this surface. At this time, the wires on the surface of the printed circuit board **300** away from the array substrate **100** are transverse wires, and the wires on the surface of the printed circuit board **300** facing the array substrate **100** are used to transfer signals between the electronic components of the printed circuit board **300**, that is, the wires are vertical wires, so that it would not exist a problem that the electronic components **301** of the printed circuit board **300** compete the space with the vertical wires, and the layout wiring of the circuit board would be more easier, and the printed circuit board **300** may be made narrower, so as to reduce the cost.

Meanwhile, since the COF **200** is attached to the surface of the printed circuit board **300** disposed with the electronic components **301**, it makes the electronic components **301** to be more close to the chip on film **200**, so that the components such as capacitor have a better function of filtering, and the performance of the printed circuit board **300** is improved.

Second Embodiment

The present embodiment provides a display apparatus, which comprises the above display panel. The display apparatus may be any product or component having displaying function, such as an OLED panel, a mobile phone, a tablet PC, a television, a display, a notebook computer, a digital photo frame, a navigator and so on.

The display apparatus of the present embodiment has the display panel in the first embodiment, so that the display apparatus has a narrower frame and a thinner thickness.

Of course, the display apparatus of the present embodiment may further comprise other conventional structures, such as a power source unit and so on.

It may be understood that the above embodiments are merely exemplary embodiments used to explain the principles of the present invention. Those with ordinary skills in the art may make various modifications and changes without departing the spirit and essential of the present invention, and these modifications and changes should be regarded within the protection scope of the present invention.

What is claimed is:

1. A display panel, comprising:

an array substrate,
a printed circuit board,
a chip-on-film comprising a chip and a film, wherein:
the chip is disposed on a first surface of the film of the chip-on-film, and one end of the first surface is attached to a connection region of the array substrate, and the other end of the first surface is attached to the printed circuit board, and